Claims

1. Catalyst complex for catalysing esterification and trans-esterification reactions, comprising:

   i) a polymeric titanium glycolate having the formula $[TiO_4(CH_2)_4]_n$ wherein n = 1 to 200; and

   ii) an alkali metal glycolate

   wherein the molar ratio of the polymeric titanium glycolate and the alkali metal glycolate is about 1.25:1 to about 100:1, preferably about 1.25:1 to about 10:1.

2. Catalyst complex according to claim 1, characterized in that the alkali metal is sodium and the glycolate has the formula $Na\text{-}O\text{-}CH_2\text{-}CH_2\text{-}OH$.

3. Catalyst complex according to claim 1 or 2, characterized in that the total content of the metals of the catalyst complex in a mixture of esterification components is 1 to about 70 ppm, preferably about 10 to about 50 ppm, referred to the acid esterification component.

4. Process for esterification of a carboxylic acid compound and an alcoholic compound using a catalyst complex according to any of the preceding claims 1 to 3, characterized in that the carboxylic acid compound is a dicarboxylic acid of the formula HOOC-R-COOH, wherein R is, linear or branched, an alkylen group, an arylene group, an alkenylen group, or a combination thereof.

5. Process according to claim 4, characterized in that R has about 2 to about 30, preferably about 4 to about 15 carbon atoms.

6. Process according to claim 4 or 5, characterized in that the carboxylic acid compound is selected from the group comprising terephthalic acid, isophthalic acid, naphthalenic

diacid, succinic acid, adipic acid, phthalic acid, glutaric acid, oxalic acid, maleic acid, and combinations thereof.

7. Process according to claim 6, characterized in that the carboxylic acid compound is terephthalic acid.

8. Process according to claim 4 or 5, characterized in that the carboxylic acid compound is an oligomer having repeating units derived from a carboxylic acid.

9. Process according to any of the preceding claims 4 to 8, characterized in that the alcoholic compound is an alkylene glycol of the formula HO-R'-OH, a polyalkylene glycol having the formula HO-[R''-O-]$_n$-H, or combinations thereof, wherein R' is an alkylene group, linear or branched, having 2 to about 10, preferably 2 to 4 carbon atoms, and wherein R'', being the same or different, is an alkylene group having 1 to about 10, preferably 1 to 5 carbon atoms.

10. Process according to claim 9, characterized in that the alcoholic compound is selected from the group comprising ethylene glycol, propylene glycol, isopropylene glycol, butylene glycol, 1-methyl propylene glycol, pentylene glycol, neopentylene glycol, and combinations thereof.

11. Process according to any of the preceding claims 4 to 10, characterized in that the process is carried out at a temperature of about 150°C to about 500°C, preferably 250°C to 300°C.

12. Process according to any of the preceding claims 4 to 11, characterized in that the process is carried out at a pressure of about 0.001 to about 10 atmospheres.

13. Process according to any of the preceding claims 4 to 12, characterized in that the molar ratio of the alcoholic compound to the carboxylic acid compound is in the range of about 0.1:1 to about 10:1, preferably about 1:1 to about 3:1.

14. Process according to any of the preceding claims 4 to 13, characterized in that the catalyst is present in the range of about 1 to about 70 ppm of esterification components, preferably about 10 to about 50 ppm, referred to the acid esterification component.

15. Process according to any of the preceding claims 4 to 14, for the preparation of poly(ethylene terephthalate).